

What is claimed is:

1. A tape application head comprising:
 - 5 means for receiving tape from a tape supply;
 - means for applying said tape to a substrate when said tape application head is moved along said substrate; and
 - a cutting assembly for cutting said tape after a predetermined amount of said tape has been applied to said substrate, said cutting assembly comprising a blade movable through said tape in a direction not substantially towards said substrate.
2. The tape application head of Claim 1 further comprising means for driving said tape through said tape application head.
- 15 3. The tape application head of Claim 2 wherein said means for driving is a tape drive unit.
4. The tape application head of Claim 1 further comprising an outfeed roller for guiding a removable tape backing to a disposal system after said tape has been applied.
- 20 5. The tape application head of Claim 1 further comprising at least one guide roller for guiding said tape from said cutting assembly to said means for applying.
6. The tape application head of Claim 1 wherein said means for applying tape to said 25 substrate is a nose.
7. The tape application head of Claim 1 wherein said side cutting assembly further comprises:
 - means for cutting said tape; and
 - 30 at least one sensor for monitoring the amount of tape which has been laid down on said substrate;
 - wherein after said at least one sensor determines the correct amount has been laid down, said sensor transmits a signal to said means for cutting said tape to cut said tape.

8. The tape application head of Claim 7 wherein said means for cutting said tape is a knife blade.

5 9. The tape application of Claim 1 wherein said guide roller is an idler roller.

10. The tape application head of Claim 1 further comprising a compliance cylinder assembly.

10 11. The tape application head of Claim 10 wherein said compliance cylinder assembly comprises:

- an air cylinder;
- a compliance brake;
- a brake mounting block, housing said compliance brake; and

15 a compliance alignment coupler.

12. A robotic tape applicator comprising:

- a means for mounting a roll of tape;
- a tape application head;

20 means for guiding the tape from the means for mounting the roll of tape to the tape application head;

the tape application head comprising:

- means for receiving tape from a tape supply;
- means for applying said tape to a substrate when said tape application head is moved along said substrate; and

25 a cutting assembly for cutting said tape after a predetermined amount of said tape has been applied to said substrate, said cutting assembly comprising a blade movable through said tape in a direction not substantially towards said substrate.

30 13. The robotic tape applicator of Claim 12 further comprising:
a tape drive unit for drawing said tape from said means for applying tape.

14. The robotic tape applicator of Claim 13 wherein said tape drive unit is motorized.

15. The robotic tape applicator of Claim 12 further comprising an outfeed roller for guiding a tape backing to a disposal system.

5 16. The robotic tape applicator of Claim 12 wherein said means for applying tape to said substrate is a nose.

17. The robotic tape applicator of Claim 12 wherein said side cutting assembly further comprises:

10 means for cutting said tape; and

at least one sensor for monitoring the amount of tape which has been laid down on said substrate;

wherein after said at least one sensor determines the correct amount has been laid down, said sensor transmits a signal to said means for cutting said tape to cut said tape.

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18. The robotic tape applicator of Claim 12 wherein said means for cutting said tape is a knife blade.

19. The robotic tape applicator of Claim 12 wherein said guide roller is an idler roller.

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20. The robotic tape applicator of Claim 12 further comprising a compliance cylinder assembly.

25 21. The robotic tape applicator of Claim 20 wherein said compliance cylinder assembly comprises:

an air cylinder;

a compliance brake;

a brake mounting block, housing said compliance brake; and

a compliance alignment coupler.

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22. A method of applying tape onto a substrate comprising the steps of:

positioning said substrate in a predetermined position, relative to a robotically controlled tape applicator; and

applying said tape, via said robotically controlled tape applicator, to said substrate.

23. The method of Claim 22 wherein said step of applying said tape is along a non-linear path.

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24. The method of Claim 22 wherein said step of applying said tape comprises the step of passing the tape past a tensioning means and a cutting means.

25. The method of Claim 24 wherein said tensioning means is a nip roller.

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26. The method of Claim 24 wherein said cutting means is a knife.

27. A method of applying a length of tape to a substrate comprising the steps of:
positioning the substrate in a predetermined position; and

15 applying tape via a robotically controlled tape applicator, said robotically controlled tape applicator comprising:

a means for holding said roll of tape;

a tape applicator head; and

at least one guide roller for guiding said tape from said means for holding said 20 roll of tape to said tape applicator head.

28. The method of Claim 27 wherein said step of applying tape comprises the steps of:
guiding an end of said tape from said means for holding said roll of tape via said at least one guide roller to said tape applicator head;

25 laying said tape on said substrate along a predetermined path; and
cutting said tape after said tape has been laid down against said substrate along said predetermined path.

29. The method of Claim 28 wherein said step of laying said tape further comprises the 30 step of providing a vacuum to provide sites of negative pressure against which the tape is slideably held.

30. The method of Claim 27 wherein said means for holding said roll of tape is a roller.

31. The method of Claim 27 wherein the substrate is an automotive part.
32. The method of Claim 27 wherein said tape applicator head comprises a knife for cutting the tape.
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33. The method of Claim 27 wherein said tape applicator head further comprises means for applying tension to said tape.

10 34. The method of Claim 33 wherein said means for applying tension is a nip roller.

35. The robotic tape applicator of Claim 4 wherein the disposal system is a vacuum system.

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